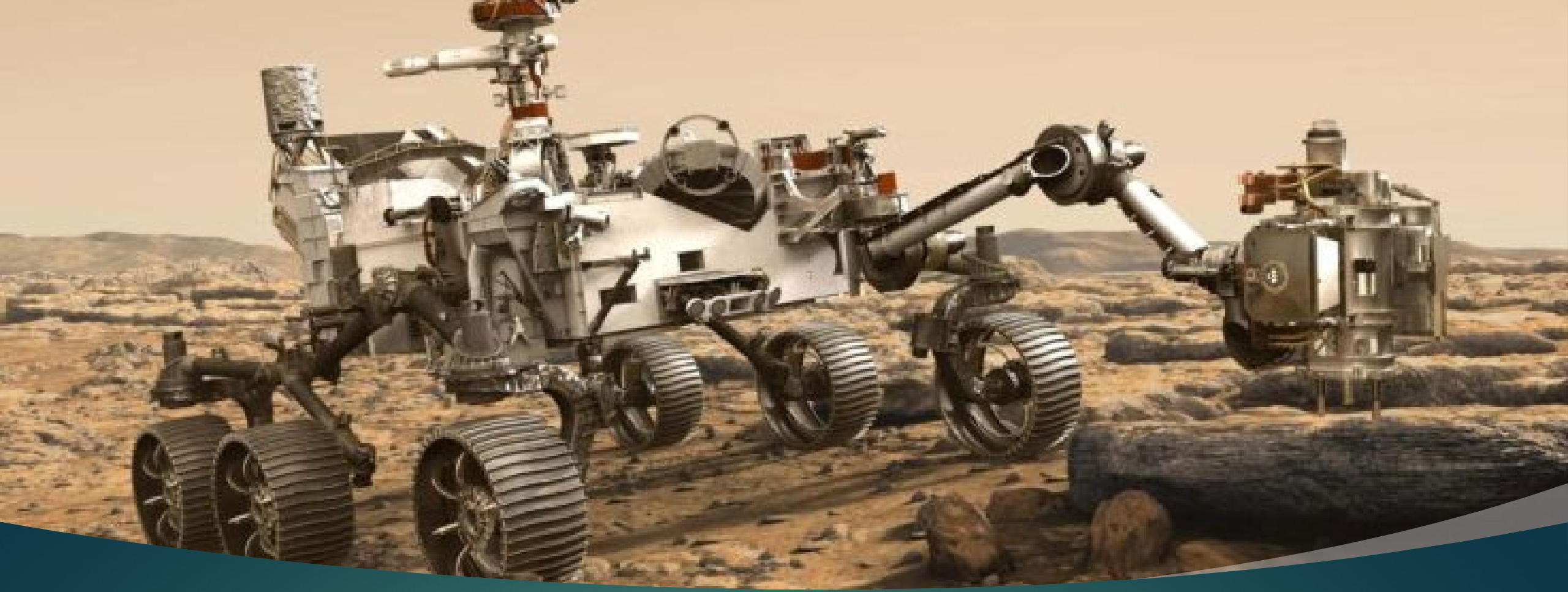
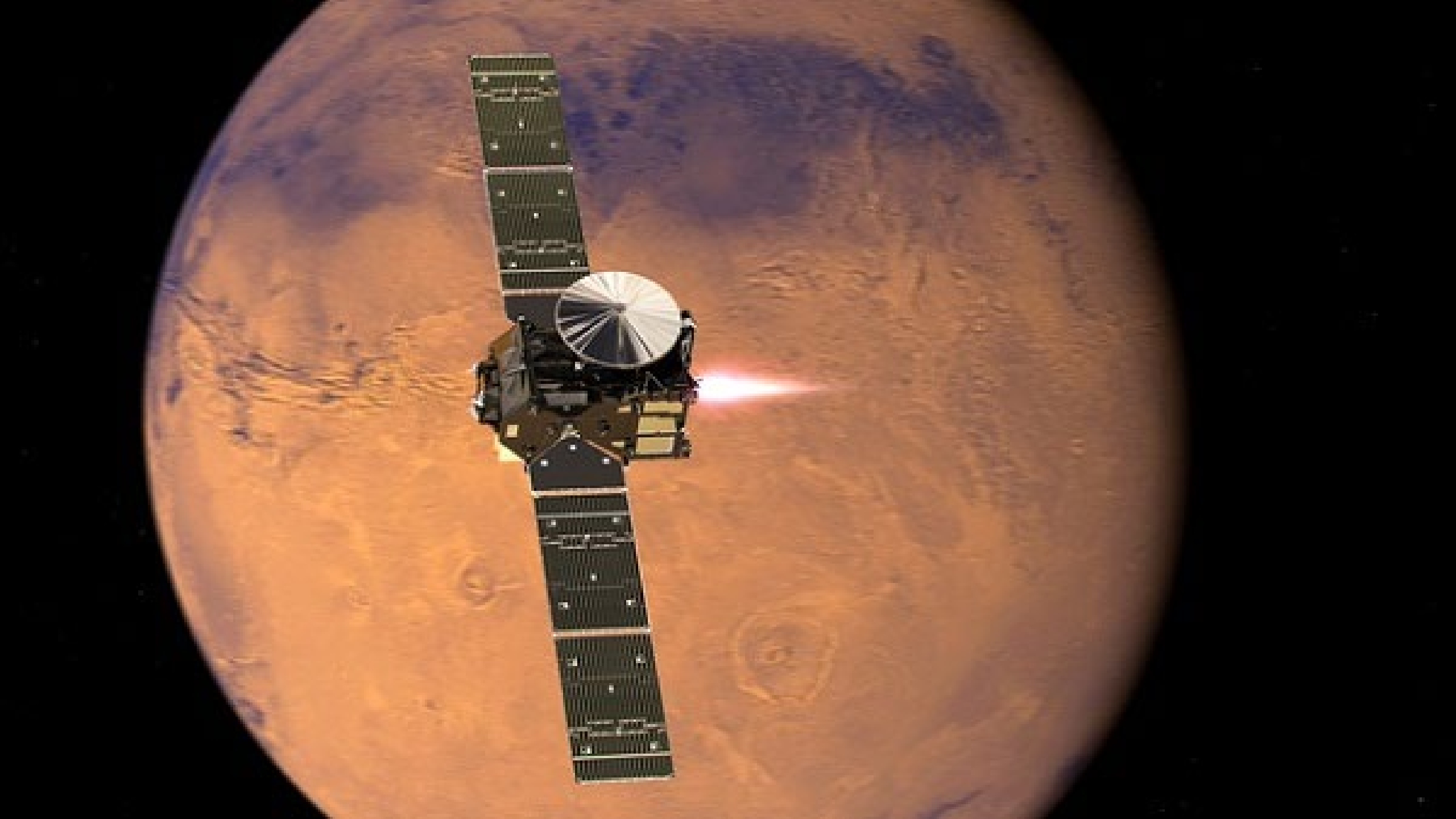


Astronomy News

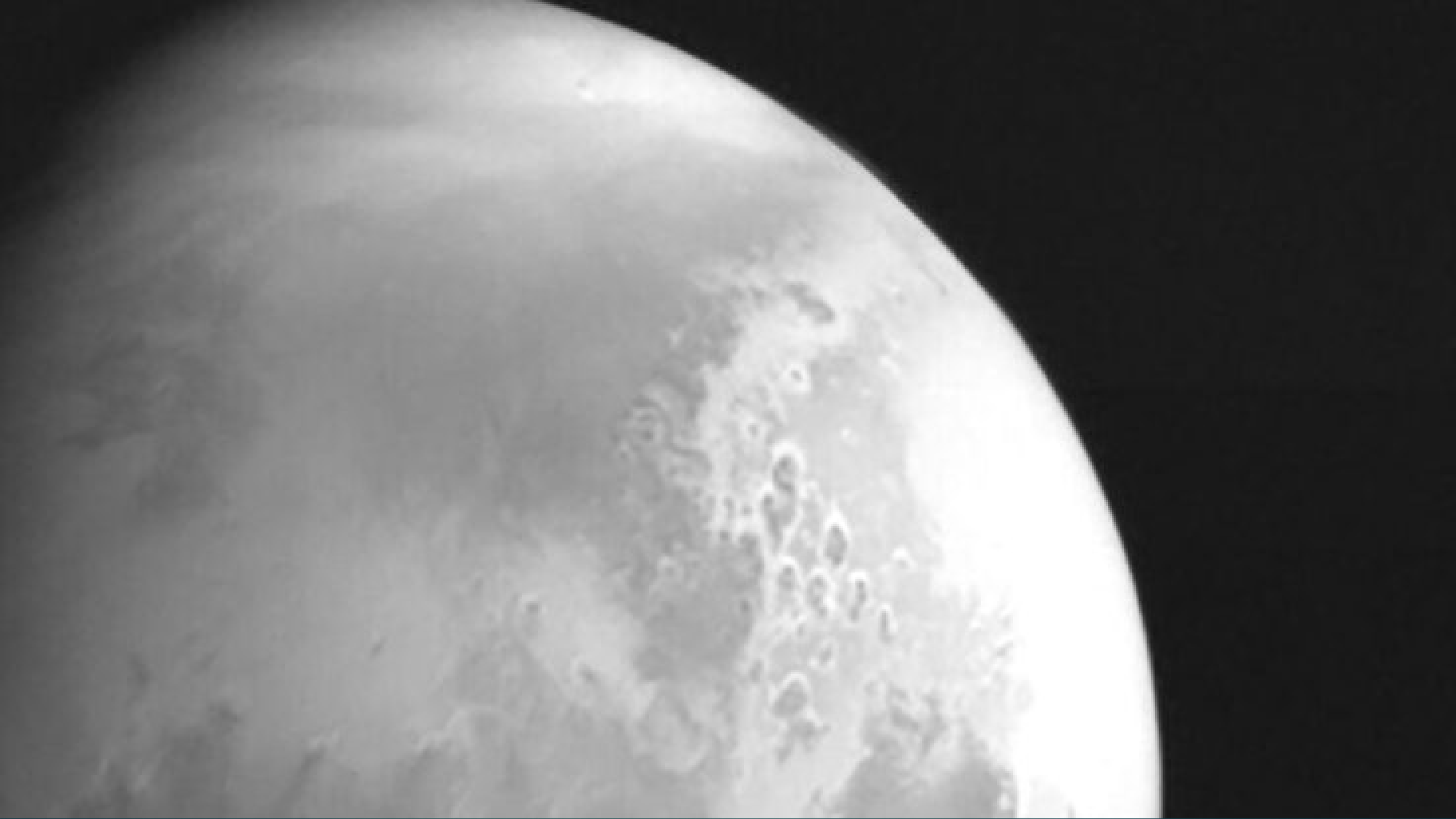
KW RASC FRIDAY FEBRUARY 26 2021

JIM FAIRLES



Two studies of the Martian atmosphere are changing the way we think about its current climate and its ancient past.

- https://skyandtelescope.org/astronomy-news/martian-atmosphere-salt-water/
- A pair of investigations using data from the ExoMars Trace Gas Orbiter (TGO, a joint European Space Agency and Roscosmos mission) are adding to our understanding of the interactions between the Red Planet's surface and atmosphere.
- The first study concerns the detection of hydrogen chloride (HCl) gas, whose origins are still unknown. On Earth, this molecule is derived mainly from seawater. Finding it on Mars has been one of the longstanding goals of the TGO science team, because it can also be a sign of geological activity.
- The second study identifies rapid variability in the ratio of variants of hydrogen atoms at different altitudes, providing new insights into how much water has been lost to space over time, and how this changes across the planet depending on climate, geography, and reservoirs (like the poles and the water found in the regolith).



China's Tianwen-1 lowers its orbit around Mars to prepare for rover landing

- https://skyandtelescope.org/astronomy-news/chinas-tianwen-1-arrives-at-mars/
- https://www.space.com/china-mars-tianwen-1-spacecraft-lowers-orbit-for-landing
- China's Tianwen-1 spacecraft has trimmed its orbit around Mars to allow the spacecraft to analyze the chosen landing region on the Red Planet.
- After the burn, which occurred on Tuesday (Feb. 23), Tianwen-1 is now in position to begin imaging and collecting data on primary and backup landing sites for the mission's rover, which will attempt to touch down in May or June.

The United Arab Emirates' Hope Enters Orbit Around Mars

- https://skyandtelescope.org/astronomy-news/united-arab-emirates-hope-enters-orbit-mars/
- On Tuesday, February 9th at about 16:00 Universal Time (11:00 a.m. EST), the Hope probe, which also goes by the moniker Emirates Mars Mission, finished burning its thrusters. Over 27 minutes, the probe had slowed from 33 km/s to 5 km/s (75,000 mph to 11,000 mph) to enter orbit around Mars. That achievement is a milestone for the fledgling UAE space agency.
- The aim of the mission is to analyze weather in the upper and lower Martian atmosphere, including regional and global dust storms and seasonal changes.

Perseverance Lands on Mars

- https://mars.nasa.gov/mars2020/ site overview
- https://www.youtube.com/watch?v=HS1CWAkbRu0 short landing
- https://www.youtube.com/watch?v=bdlfdBiSzKw tour via mastcam-Z from Thursday afternoon

February 24, 2021

- This shows the rim of Jezero Crater as seen in the first 360-degree panorama taken by the Mastcam-Z instrument aboard NASA's Perseverance Mars rover.

February 22, 2021

- The High Resolution Imaging Experiment (HiRISE) camera aboard NASA's Mars Reconnaissance Orbiter (MRO) was able to capture this image of NASA's Perseverance rover on the surface of Mars. The image was taken on Feb. 19, 2021.
- It is a close-up version of a larger image showing several parts of the Mars 2020 mission landing system that got the rover safely on the ground, Perseverance and Mars 2020 Spacecraft Components on the Surface.
- These close-ups of Mars 2020 hardware were processed to make them easier to see.
- MRO's mission is managed by NASA's Jet Propulsion Laboratory, a division of Caltech in Pasadena, California, for NASA's Science Mission Directorate. Lockheed Martin Space in Denver, built the spacecraft. The University of Arizona provided and operates HiRISE.
- A key objective for Perseverance's mission on Mars is astrobiology, including the search for signs of ancient microbial life. The rover will characterize the planet's geology and past climate, pave the way for human exploration of the Red Planet, and be the first mission to collect and cache Martian rock and regolith (broken rock and dust).
- Subsequent NASA missions, in cooperation with ESA (European Space Agency), would send spacecraft to Mars to collect these sealed samples from the surface and return them to Earth for in-depth analysis.
- The Mars 2020 Perseverance mission is part of NASA's Moon to Mars exploration approach, which includes Artemis missio

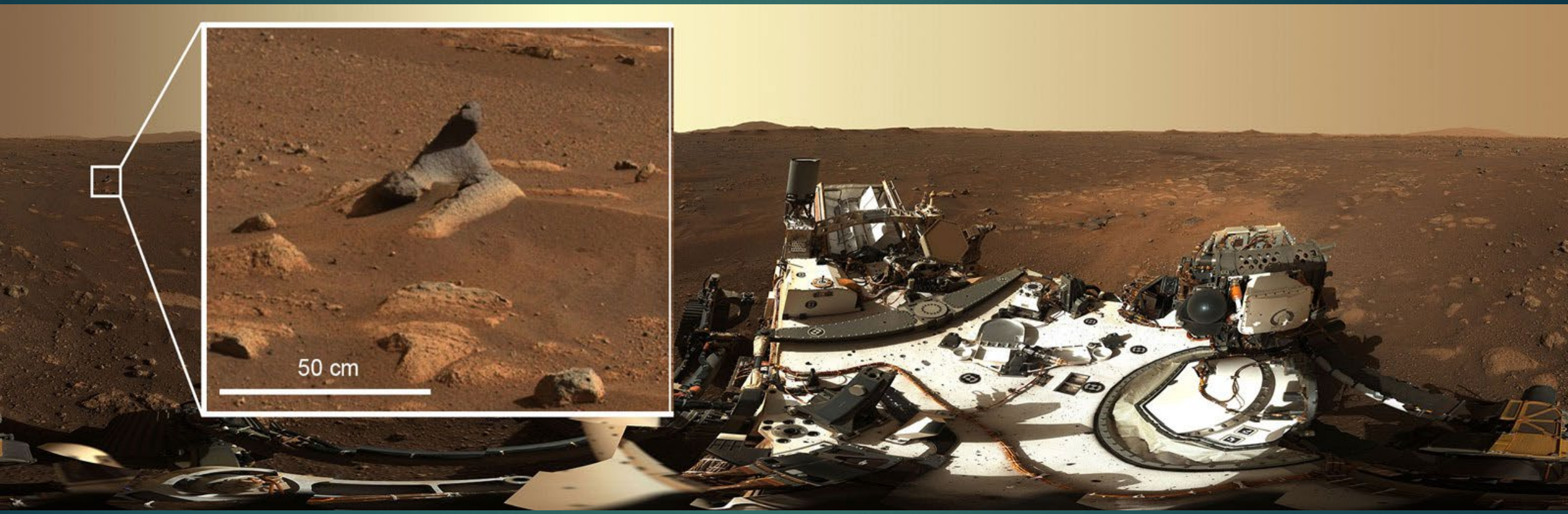

W
34
31
11
10
58
118
N
S
H
G
G
T
D
Y
A
I
N
R
E
M
I
H
T

February 25, 2021

- This annotated image was taken by a parachute-up-look camera aboard the protective back shell of NASA's Perseverance rover during its descent toward Mars' Jezero Crater on February 18, 2021. Using binary code, two messages have been encoded in the neutral white and international-orange parachute gores (the sections that make up the canopy's hemispherical shape).

- The inner portion spells out "DARE MIGHTY THINGS," with each word located on its own ring of gores. The outer band of the canopy provides GPS coordinates for NASA's Jet Propulsion Laboratory in Southern California, where the rover was built and the project is managed.

- Mars 2020 Perseverance Systems Engineer Ian Clark designed the binary code pattern. The saying is JPL's motto and is an abridgement of a quote from Teddy Roosevelt's "Strenuous Life" speech: "Far better is it to dare mighty things, to win glorious triumphs, even though checkered by failure ... than to rank with those poor spirits who neither enjoy nor suffer much, because they live in a gray twilight that knows not victory nor defeat."


50 cm

February 24, 2021

- This wind-carved rock seen in first 360-degree panorama taken by the Mastcam-Z instrument shows just how much detail is captured by the camera systems.

Listen to the Audio From Mars

- https://mars.nasa.gov/mars2020/multimedia/audio/

Questions?